National Science Foundation Industry/University Cooperative Research Centers

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FY2020 Process Outcome Survey Results

Descriptive Statistics Compiled from Industry, Faculty & Student Surveys

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REPORT PROCESSING & DATA ISSUES

This report provides descriptive statistics of the IUCRC Process Outcome Questionnaires. Data were collected during the fall of 2020 and spring 2021 and refer to the Center activity for FY2020.

Since most evaluators use this report to benchmark their Center compared to a program-wide "norm", we have reported "Center-level" means and standard deviations. That is, means (unweighted) for each center were used to calculate a Center-level mean. For forced choice questions, frequencies for individual respondents were also reported.

Industry Questionnaires

Starting in FY2017, data were collected using two industry surveys; A Pulse Survey and Benefits Inventory, administered at alternate semi-annual Center IAB meetings (two industry surveys per year). See the IUCRC Evaluation project website for current and past versions of the surveys (http://www.ncsu.edu/iucrc/ResourcesForEvaluators.htm#Surveys) Begining with this report, the Pulse and Benefits surveys are administered in alternate years (one survey per year, alternating between the two versions). This survey administration schedule was adopted if FY2020 to better manage response burden on IUCRC members and time metrics relative to Center maturity and reporting needs. As a result, industry questionnaire response rates will differ from previous years.

Faculty Questionnaires

The faculty questionnaire includes two versions: a long version (13 items) that is used by Centers during the first phase (in year 1-5) and a short version (6 items) that is used by Centers during the second and third phase (in year 6-15) of NSF funding. Since both the faculty long and faculty short questionnaires share some of the same questions, data for these shared questions were pooled for analysis. In the tables below, questions only included in the long version are noted as follows: (L).

Student Questionnaires

The student questionnaire was implemented as a required instrument towards the end of FY2016. The student survey was substantially revised for FY2019. See the IUCRC Evaluation project website for current and past versions of the surveys (http://www.ncsu.edu/iucrc/ResourcesForEvaluators.htm#Surveys).

RESPONSE RATES

Industry

Category	Center Level		Member Level	
	Pulse	**Benefits**	**Pulse**	**Benefits**
Response Frequency				
Continuing Population from CD report	73	73	1152	1152
1st Year Reporting Population from CD report	+0	+0	+0	+0
Retired Centers Reporting	+1	+0	+1	+0
NCE/Defunct Centers	15	15	169	169
NCE/Defunct Centers Reporting[1]	+4	+2	+26	+20
Population[2]	63	60	1010	1003
Centers That Did Not Return Data [3]	17	27	379	376
Available Population [4]	46	33	631	627
Data Received	46	33	254	214
Received / Population	73.02%	55.00%	25.15%	21.34%
Received / Available Population	100%	100%	40.25%	34.13%

Faculty and Students

Category	Center Level		Individual Level	
	Faculty	**Students**	**Faculty**	**Students**
Response Frequency				
Continuing Population from CD report	73	73	1061	1893
1st Year Reporting Population from CD report	+0	+0	+0	+0
Retired Centers Reporting	+0	+0	+0	+0
NCE/Defunct Centers	15	15	177	300
NCE/Defunct Centers Reporting[5]	+1	+3	+5	+42
Population[6]	59	61	889	1635
Centers That Did Not Return Data[7]	21	25	324	668
Available Population[8]	38	36	565	967
Data Received	38	36	276	267
Received / Population	64.41%	59.02%	31.05%	16.33%
Received / Available Population	100%	100%	48.85%	27.61%

LONG FACULTY FORM VS. SHORT FACULTY FORM

	Long Form	**Short Form**
# of items	13	6
# of questions in common	6	6
# of unique questions	7	0
# of Centers using form	17	25
Sample size	106	170

[1,5] Retired/defunct Centers and Centers on no-cost extension (NCE) are not required to submit data, but some do. If so, those data were included in the analysis.

[2,6] Population was defined as centers that were at least 1 year old, and were not classified as NCE, graduated, or retired.

[3,7] Centers were excused for reasons such as being in the midst of center restructuring, high respondent turnover, and respondent refusal to complete surveys

[4,8] Numbers based on population minus excused and not returned counts.

FY2020 IUCRC Evaluation Project

Industry Results: FY2020

Pulse Survey

Table 1. Satisfaction

1. Please rate your level of satisfaction with the following aspects of the center:

| | Individual Frequencies | | | | | | | | | | Center Level | |
| | Not Satisfied (1) | | Slightly Satisfied (2) | | Somewhat satisfied (3) | | Quite Satisfied (4) | | Very Satisfied (5) | | Missing Data | | | |
	N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
a. Center Research	0	0.0	1	0.4	17	6.3	135	50.4	115	42.9	6	4.38	0.26
b. Center Administration	0	0.0	4	1.5	14	5.2	104	38.9	145	54.3	7	4.49	0.32
c. Center Meetings	2	0.8	3	1.1	22	8.3	126	47.7	111	42.1	10	4.29	0.40

Table 2. Areas for Improvement

3. How can the Center improve? Please mark areas that need improvement.

| | Individual Frequencies | |
	N of Responses	% of Respondents^
a. Planning the Research Program	26	9.5
b. Project Selection	30	10.9
c. Project Development and Management	30	10.9
d. Project Results Reporting	58	21.2
e. Dissemination of Results via Publications	33	12.0
f. Technology Transfer	62	22.6
g. Intellectual Property Management	30	10.9
h. Fundraising & Recruiting New Members	88	32.1
i. IAB Meetings	21	7.7
j. Communication	42	15.3
k. Center Personnel	1	0.4
l. Other	12	4.4

> *"It appears to me that each of the centers do not practice the same best practices. I would assume that if they are all working together, they would do a better job with reporting and communicating to the research team and IAB."*

> *"A standardized technology transfer stage at the end of each topic life-cycle is needed and strongly suggested to implement."*

^ Respondents were encouraged to check as many boxes as applied. Therefore, the percentage across all items may total to greater than 100%.

Table 3. Renewal Intentions

5. Will you renew your membership next year?

| Individual Frequencies | | | | | | | | | | | Center Level | |
| Definitely Not (1) | | Probably Not (2) | | Uncertain (3) | | Probably Yes (4) | | Definitely Yes (5) | | Missing Data | | | |
N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
1	0.4	2	0.8	29	11.0	132	50.1	99	37.6	11	4.20	0.38

Table 4. Member Descriptors

6. How many years has your organization been a member in this center?

| Member Level | | Center Level | |
Mean	S.D.	Mean	S.D.
4.27	4.18	4.30	2.59

| 7. Organization Type/Size | Individual Frequencies | |
	N	%
1. For-Profit Large (> 500 Employees)	152	56.9
2. For-Profit Small (11- 500 Employees)	42	15.7
3. For Profit-Micro (< 10 Employees)	21	7.9
4. Government (Federal/State/Local)	39	14.6
5. Non-Profit / Other	13	4.9
Total Reported	267	100.0

Benefits Inventory

Part 1: Networking Benefits

Table 4. New Connections & Partnerships

1. Please indicate which of the following networking benefits listed below, if any, were realized by your organization, <u>in the last two years.</u> Please mark all that apply.

	Member Level		Center Level	
	N	**%**	**Mean %**	**S.D.**
a. In the current membership year, has your organization established any new, valuable connections with other Center participants (industry, government, faculty, students, others)?	159	74.3	73.94	25.56
b. Developed partnerships with other IAB members (e.g., research partnership, collaboration, joint investment)	71	33.2	37.61	33.28
c. Developed partnerships with university faculty or researchers (e.g., one-to-one research contract, collaboration on a grant, consulting)	107	50.5	53.49	33.64
d-1. Hired any students working on center research projects as a full-time employee, contractor, or intern.	45	21.0	17.53	20.37
e. Other	17	7.9	6.46	11.28
f. None of these	26	13.1	18.27	31.14

Table 5. Students Hired ^

1d-2. If "yes" to "Hired any students working on center research projects as a full-time employee, contractor, or intern." How many students hired? *Sample: N of members = 260; N of centers = 38*

	Member Level	
Member Level Scores	**Mean**	**S.D.**
Number of students hired per respondent organization	0.35	0.88
Center Level Scores	**Center Level**	
Number of students hired per respondent organization per center	0.28	0.38
Number of students hired by respondent organizations per center	2.18	3.37
Program Level Scores	**Program Level**	
Total number of students hired by respondent organizations	72	

Part 2: Research & Development Benefits

Table 6. Research Relevance

2. Please indicate the R&D benefits your organization has received from access to Center research, by estimating what percentage of the projects funded <u>during the current membership year</u>, fall into each of the following categories (Total must sum to 100%):

	Member Level		Center Level	
	Mean %	S.D.	Mean %	S.D.
a. <u>Not Relevant Research</u>: % of projects that are probably not relevant to your organization's current or future needs	28.73	24.60	26.21	16.85
b. <u>Adjacent Research</u>: % of projects that are potentially relevant to your organization's current or future needs, but in an area that is outside your organization's current focus	27.19	15.69	28.08	11.24
c. <u>Core Research</u>: % of projects so relevant to your organization's current or future needs that your organization would almost certainly have conducted or contracted out a similar project within the next two years, if the project were not being conducted at the Center	27.75	20.31	27.50	15.11
d. <u>Transformational Research</u>: % of projects that are potentially relevant to your organization's current or future needs, but too risky/blue sky for internal investment	16.33	16.92	18.21	18.01

Research Cost Avoidance Estimates:**

Research Cost avoidance (RCA) is defined as savings a member obtains by having "necessary" research projects performed by a center rather than performing them internally. The following RCA calculations are based on a member's report of the number of projects they consider a "high enough priority they would conduct internally" (Q4c), number of scientist months it would take to complete a typical center project (Q1b), the cost of a scientist month (based on archival data), and cost of center membership (archival data). For a more detailed explanation of how this estimate is calculated see Appendix A.

Sample: N of respondents = 288, N of centers = 40

Average Research Cost Avoidance (RCA)			
Member Level Scores	**Mean**	**Median**	**S.D.**
a. Average dollar value (in thousands) of avoided projects per respondent organization Av.RCA member = (N of projects considered core (Q4c) * Median of months * Median cost per scientist month) – Primary Fee	740.87	423.79	672.09*
Center Level Scores	**Mean**	**Median**	**S.D.**
b. Average dollar value (in thousands) of avoided projects per respondent organization	4,132.17	2,164.00	3,393.77*
Program Level Scores	**Sum**		
c. Total dollar value (in thousands) of avoided projects by respondent organizations	$128,007.3		

*31 members (11%) have negative RCA that results in large standard deviation.
** It is worth noting that since only 36% of members completed the questionnaire; this is a very conservative estimate of the value of accelerated/avoided projects supported by members.

Table 7. Impact on Member Research & Development

3. Consider the center's research portfolio and specifically the projects in which your organization is most interested. In which of these ways, if any, have the center's research findings and outputs (including those from this year and any prior years) affected your organization's internal R&D <u>in the last two years</u>? Check all that apply.

	Member Level		Center Level	
	N	%	Mean %	S.D.
a. Helped accelerate the pace and/or completion of your organization's ongoing internal (or externally contracted) R&D projects.	84	43.3	51.33	31.92
b. Helped your organization decide against starting one or more new R&D projects that otherwise would have been initiated	42	21.6	24.58	31.68
c. Triggered development of new R&D projects, or significantly redirected pending projects within your organization	63	32.5	37.27	32.31
d. Helped advanced the Technology Readiness Level (TRL) of technology being developed within your organization	69	35.6	34.66	27.47
e. None of these	45	23.2	23.56	26.86

Research Cost Savings

If yes[to Q3a or Q3b][5], Taking into account personnel, facility and related costs, please estimate:

Member Level Scores (in thousands)	Median ($k)	Mean ($k)	S.D.	n
a. Money saved on accelerated projects*	0.0	162.6	801.7	169
b. Money saved on avoided projects	0.0	34.8	133.0	178
a + b. Money saved on accelerated or avoided projects	0.0	182.1	791.2	185
Center Level Scores	**Median**	**Mean**	**S.D.**	**n**
a. Money saved on accelerated projects	250	886.6	2083.4	31
b. Money saved on avoided projects	0.0	200.0	385.4	31
a + b. Money saved on accelerated or avoided projects	325	1086.6	2223.5	31
Program Level Scores	**Sum**			
a. Total money saved on accelerated/completed projects	$27,485,000			
b. Total money saved on avoided projects	$6,200,000			
a + b. Total money saved on accelerated, completed, or avoided projects	$33,685,000			

Interpreting Research Cost Savings

- The average member respondent saved $162,600 in R&D costs during the survey period as a result of participation in the IUCRC program. Centers have an average of 16 members.
- The average Center saved its members $1,086,600 in R&D costs during the survey period.
- There were 73 active Centers, serving 1,152 members in FY2020. The IUCRC program saved participating companies a total of $33.7M in R&D costs in the last year as a result of participation in the IUCRC program. These figures are based on feedback from firms responding to this survey. Member response rate was 34.13% (214 out of the available population of 627 responded to the survey) from 33 centers included in the data collection. Therefore, these are conservative estimates of the Research Cost Savings at the member, center and program levels.

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[5] Responses of no to 3a or 3b are treated as 0 for summary statistics.

Stimulated Research

If yes[to Q3c], *taking into account personnel, facility and related costs, please estimate how much money invested in new/redirected projects*

Dollar value of center-stimulated projects (in thousands)	Median ($k)	Mean ($k)	S.D.	n
Member Level Scores	0	81.8	259.4	172
Center Level Scores	175	454.0	675.9	31
Program Level Scores	14,075,000			

**It is worth noting that since only 34.13% of members completed the questionnaire; this is a very conservative estimate of the value of center stimulated
projects supported by members.

Part 3: Technology Translation & Commercialization Benefits

Table 8. Technology & Knowledge Transfer

4. <u>During the last two years</u>, in which of these ways has your organization benefited from technology or knowledge transfer from the Center? Please mark all that apply.

	Member Level		Center Level	
	N	%	Mean	S.D.
a. Accessed capabilities and insights (e.g., center facilities, equipment, faculty or student capabilities, insights from other members, etc.) to which your firm would not otherwise have access	136	73.1	73.83	26.42
b. Licensed center's IP	6	3.2	1.37	4.78
c. Produce your own IP related to research at the center	17	9.1	8.89	19.36
d. Helped your org. identify new applications for technology trying to develop	82	44.1	45.50	34.61
e. Helped your org. anticipate or address some regulatory issues in your industry	26	14.0	16.71	24.24
f. None of these	26	14.0	15.91	21.08

Table 9. Commercial & Financial Benefits

5a. <u>During the last two years</u>, has your organization realized any commercial or financial benefit that involved the translation of the center's current or prior years' research findings and outputs? Please mark all that apply.

	Member Level		Center Level	
	N	%	Mean %	S.D.
a1. Launch new products or services based on what you learned from the center	10	5.5	7.61	19.58
a2. Improve existing products or services based on what you learned from the center	44	24.3	28.39	31.18
a3. Improve operational or manufacturing processes based on what you learned from the center	31	17.1	16.52	32.69
a4. None of these	108	59.7	56.17	33.30

5b. *[If yes to any]* Would these commercial or financial benefits have been realized in the absence of the center?

Individual Frequencies									Center Level	
No, the center played a critical role in realizing these benefits (1)		Yes, but the benefits would have been delayed without the center's involvement (2)		Yes, the center had only limited influence on our ability to realize these benefits (3)		N/A		Missing Data		
N	%	N	%	N	%	N	%	N	Mean	S.D.
19	10.5	44	24.3	10	5.5	108	59.7	0	1.85	0.40

	Member Level		Center Level	
	N	%	Mean %	S.D.
6. Have any of these technology translation-related benefits contributed to the addition of new jobs at your organization?	40	21.9	21.05	24.42

7. Thinking about the technology translation benefits experienced by your organization, what has been the most important or significant impact? Please describe. If possible, provide a quantifiable measure of the economic value of that benefit (e.g., $s saved, time saved, waste/scrap reduced, etc.).

"The connections made have strengthened relationships among partnering agencies which enhance mission success and productivity. It's tough to put a value on R&D benefits experience, but the most significant impact has been the access to both the research outcomes/products. CITeR is providing R&D results that are directly relatable to current organizational areas of interest. [...] Access to data collected from CITeR projects has been a great benefit."	"Connections made through the Center allow me to communicate with people that have valuable insights about R&D projects and business that I otherwise would likely not have contact with. Access to researchers, faculty, R&D facilities, and other members that our company would not otherwise have. The Center allows us to be engaged in leveraged sustainability related R&D we would not fund on our own and that has potential indirect longer term benefits to our company."
"The creation of scientific networks that have been established through the first round of CBM projects have been the greatest direct benefit to our company. This has been especially important for the engagement of new researchers across the different sites of our newly formed company."	We were able to leverage [CITeR] to receive valuable deliverables significantly cheaper and quicker than the government can contract a similar industry partner. Access to world class research to inform organic development efforts. Ability to access verification and validation resources not possible in the government. Value [is equivalent to] ~$200k."
"[A benefit was] 1000 Research hours saved on filtering good approaches for process optimisation.	"[A benefit was] new product ideas. Time to implement. For every dollar that we invest, we get ten times that back."
"The connections made have strengthened relationships among partnering agencies which enhance mission success and productivity. It's tough to put a value on R&D benefits experience, but the most significant impact has been the access to both the research outcomes/products. [The Center] is providing R&D results that are directly relatable to current organizational areas of interest. It is unknown of anywhere else we'd have access to this material at the current membership cost. Access to data collected from [Center] projects has been a great benefit."	"Connections with industry partners and research universities have helped to have access to resources or information."
	"Of most benefit has been having a "fresh set of eyes" looking at historical research gaps. Obtaining the perspective of scientists that have not been entrenched in the same problem for years provides opportunities for novel solutions."

Part 4: Member Information

Table 10. Member Descriptors

10. How many years has your organization been a member in this center?

Member Level		Center Level	
Mean	S.D.	Mean	S.D.
4.58	4.32	4.71	3.44

11. Organization Type/Size

	Individual Frequencies	
	N	%
1. For-Profit Large (> 500 Employees)	90	48.9
2. For-Profit Small (11- 500 Employees)	33	18.1
3. For Profit-Micro (< 10 Employees)	16	8.8
4. Government (Federal/State/Local)	34	18.7
5. Non-Profit / Other	10	5.5
Total Reported	183	100

Faculty Results: FY2020

Table 1. Research

1. Compared to the research projects that you typically conduct outside the Center, would you describe your Center funded research as: (L)*

Individual Frequencies											**Center Level**	
Much more basic (1)		More basic (2)		Same (3)		More Applied (4)		Much more applied (5)		Missing Data		
N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
0	0.0	5	4.7	34	31.8	58	54.2	10	9.4	0	3.65	0.33

* Indicates a question that is unique to the long version of the faculty questionnaire.

2. During the past year, how satisfied were you with the following?

	Individual Level											**Center Level**	
	Not Satisfied (1)		Slightly Satisfied (2)		Somewhat Satisfied (3)		Quite Satisfied (4)		Very Satisfied (5)		Missing Data		
	N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
a. Quality of the Center-supported research program	1	0.4	2	0.7	15	5.6	99	36.7	153	56.7	7	4.48	0.29
b. Relevance of the Center's research program to my professional goals	1	0.4	6	2.2	23	8.6	83	31.0	155	57.8	9	4.50	0.35

Table 2. Impact

4. During the past year, what impact has participation in the Center had for YOU in the following areas? (L)*

	Individual Level											**Center Level**	
	No Impact (1)		Somewhat Positive Impact (2)		Moderately Positive Impact (3)		Very Positive Impact (4)		Extremely Positive Impact (5)		Missing Data		
	N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
a. The feeling of accomplishment I get from the research I do.	7	6.7	3	2.9	8	7.6	37	35.2	50	47.6	2	4.11	0.65
b. Opportunities for research contracts/grants.	6	5.7	4	3.8	16	15.2	28	26.7	51	48.6	2	4.09	0.54
c. Recognition I receive for the work I do.	7	6.7	7	6.7	16	15.4	31	29.8	43	41.4	3	3.94	0.62
d. Access to useful equipment.	25	23.8	6	5.7	17	16.2	23	21.9	34	32.4	2	4.00	0.73
e. Ability to support graduate students.	11	10.5	10	9.5	5	4.8	28	26.7	51	48.6	2	3.86	0.61
f. Ability to publish my work in quality proceedings and journals.	14	13.3	7	6.7	12	11.4	32	30.5	40	38.1	2	3.70	0.48

* Indicates a question that is unique to the long version of the faculty questionnaire.

Table 3. Commitment

5. Which option best expresses your current intentions?

	Individual Frequencies											**Center Level**	
	Definitely Not (1)		Probably Not (2)		Uncertain (3)		Probably Yes (4)		Definitely Yes (5)		Missing Data		
	N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
Next year I will submit my best research ideas in a center funded proposal	3	1.1	9	3.4	34	12.7	94	35.1	128	47.8	1	4.24	0.44

Table 4. Satisfaction

6. During the past year, how satisfied were you with center administrative operations?

	Individual Frequencies											**Center Level**	
	Not Satisfied (1)		Slightly Satisfied (2)		Somewhat Satisfied (3)		Quite Satisfied (4)		Very Satisfied (5)		Missing Data		
	N	%	N	%	N	%	N	%	N	%	N	Mean	S.D.
	3	1.1	1	0.4	18	6.7	74	27.7	171	64.0	10	4.57	0.34

Table 5. Areas for Improvement

7. How can the Center improve? Please mark areas that need improvement.

	Individual Frequencies	
	N of Responses	**% of Respondents^**
a. Communication	41	14.8
b. Planning & development of research program	46	16.6
c. Management of projects	13	4.7
d. Project selection	32	11.6
e. Proposals & publications	19	6.9
f. Technology transfer	27	9.8
g. Intellectual property	15	5.4
h. Fundraising	72	26.0
i. Other	27	9.8

^ Respondents were encouraged to check as many boxes as applied. Therefore, the percentage across all items may total to greater than 100%.

3. How can the area(s) be improved?	**8. Are there any features of the administration and operations you are particularly pleased with?**
"Fundraising is a challenge with many companies limiting their budget and new prospective members unable to travel and see the student posters, meet in person, have those off-meeting conversations in the lobby, etc."	"I am very pleased with the professionalism and dedication that the center has been administered and operated. I feel that the amount of paperwork is very decent and that the center has been running very smoothly."
"Given the number of projects and involved students, [...] more students could be employed by the industry partners."	"The support staff has done an excellent job with organization and planning."
"Project selection is a little confusing to the PIs because we don't always get much feedback, and voting results do not always follow previous trends"	"It is invaluable to have some of the senior members of the center present to advise and guide the current leadership. This includes NSF oversight as well [...]"
"Communicate capabilities of the center to attract more industry partners to join the center and show stronger capabilities to manage corresponding projects. Also, having an IAB compose of a group of more diverse members."	"We tend to attract some excellent students, and I'm very proud of the work they are doing."

Student & Postdoc Results: FY2020

Table 1. Training Opportunities

1. Please indicate whether your Center experience has included the following opportunities:

| | Individual Frequencies | | | | | | Center Level | | | | | |
| | Not available (1) | | Available, but did not participate (2) | | Available, and did participate (3) | | Missing Data | Not available (1) | | Available, but did not participate (2) | | Available, and did participate (3) | |
	N	%	N	%	N	%	N	Mean %	S.D.	Mean %	S.D.	Mean %	S.D.
a. Work on innovative or leading-edge research projects	4	1.5	21	7.9	240	90.6	2	0.9	3.4	10.5	26.9	83.7	31.9
b. Pursue research questions that address "real-world" problems	2	0.8	10	3.8	253	94.8	2	0.3	1.8	2.8	5.6	92.0	20.1
c. Engage in experiential "hands-on" learning	11	4.1	21	7.9	233	87.9	2	3.8	9.2	11.3	21.8	80.3	27.3
d. Stay informed about Center projects related to your research interests	10	3.8	23	8.7	232	87.6	2	7.8	22.0	8.0	12.2	79.4	27.4
e. Have access to scientific data, tools, techniques, expertise, equipment, software, or other resources that are not otherwise available to you	18	6.8	27	10.2	219	83.0	3	6.3	12.0	11.0	20.4	74.1	31.3
f. Collaborate with government or industry scientists	14	5.3	49	18.6	200	76.1	4	5.5	11.2	14.8	18.0	70.6	32.0
g. Collaborate with faculty or students from other institutions	14	5.3	93	35.2	157	59.5	3	9.0	21.6	35.2	30.5	47.1	34.5
h. Work with people from different demographic or disciplinary backgrounds	10	3.8	35	13.7	217	82.8	5	4.1	10.7	15.7	27.3	70.8	36.7
i. Attend Center IAB meetings	10	3.8	24	9.1	229	87.1	4	2.5	6.1	6.3	13.7	82.5	30.3
j. Present research at Center IAB meetings	10	3.8	33	12.6	220	83.7	4	2.0	5.9	10.2	15.1	79.1	29.6
k. Participate in other professional development opportunities offered through the Center	44	16.5	84	31.5	133	49.8	6	12.4	14.6	33.1	27.5	45.7	32.8

Table 2. General Evaluation

2. Overall, how satisfied are you with your experience participating in this Center?

Individual Frequencies											Center Level	
Not satisfied (1)		Slightly satisfied (2)		Somewhat satisfied (3)		Quite satisfied (4)		Very satisfied (5)		Missing Data		
N	%	N	%	N	%	N	%	N	%		Mean	S.D.
0	0.0	8	3.0	15	5.7	82	31.2	158	60.1	4	4.44	0.51

Table 3. Impact on Trainee Knowledge & Skills

5. Please indicate how impactful your Center experience has been for you in the following areas:

	Individual Frequencies										Not Sure (9)	Missing Data	Center Level	
	No Impact (1)		Slightly Positive Impact (2)		Moderately Positive Impact (3)		Positive Impact (4)		Very Positive Impact (5)					
	N	%	N	%	N	%	N	%	N	%			Mean	S.D.
a. Improved my technical knowledge and skills	2	0.8	5	1.9	13	4.9	72	27.4	171	65.0	0	4	4.52	0.40
b. Improved my oral communication skills	4	1.5	12	4.6	20	7.6	86	32.8	140	53.4	0	5	4.32	0.49
c. Improved my written communication skills	13	5.0	15	5.8	32	12.4	89	34.4	110	42.5	0	8	4.09	0.52
d. Improved my project management skills, like setting and meeting timelines and deliverables	9	3.5	15	5.8	26	10.0	79	30.3	132	50.6	1	6	4.12	0.49
e. Improved my ability to work as a member of a team	11	4.2	12	4.6	26	10.0	81	31.0	131	50.2	1	6	4.23	0.48
f. Improved my ability to publish papers in academic journals or conferences	21	8.4	15	6.0	22	8.8	82	32.7	111	44.2	3	16	4.10	0.58
g. Improved my understanding of how research applies to "real-world" problems	4	1.5	11	4.2	18	6.8	73	27.8	157	59.7	2	4	4.52	0.39
h. Improved my understanding of industry research trends and needs	3	1.2	10	3.8	26	10.0	72	27.6	150	57.5	1	6	4.29	0.41
i. Improved my awareness of career paths in industry	9	3.5	21	8.2	27	10.6	78	30.5	121	47.3	2	11	3.86	0.62
j. Improved my awareness of internship or job openings at Center member organizations	22	8.9	24	9.7	40	16.2	62	25.1	99	40.1	4	20	3.65	0.68

Table 4. Career Outcomes

6a. What is your career goal?

	Individual Frequencies		Center Level	
	N	%	Mean	S.D.
Work in academia (1)	56	21.1	18.3	24.4
Work in industry (2)	155	58.5	53.7	35.9
Work in government (3)	15	5.7	8.2	24.6
Work at a non-profit/foundation (4)	3	1.1	0.5	2.0
Start my own company (5)	7	2.6	3.3	10.3
Undecided (6)	24	9.1	9.5	20.8
Other (please specify) (7)	5	1.9	2.6	7.7
Missing Data	2			

6b. *[If starting own company]* Will your company be based on an idea from your Center research?

Individual Frequencies								Center Level					
Yes (1)		No (0)		Unsure (2)		Not Applicable	Missing Data	Yes (1)		No (0)		Unsure (2)	
N	%	N	%	N	%	N	N	Mean %	S.D.	Mean %	S.D.	Mean %	S.D.
1	14.3	1	14.3	5	71.4	258	0	0.07	0.4	0.6	3.0	2.3	9.2

6c. Has your career goal changed as a result of your Center participation?

Individual Frequencies							Center Level					
Yes (1)		No (0)		Unsure (2)		Missing Data	Yes (1)		No (0)		Unsure (2)	
N	%	N	%	N	%	N	Mean %	S.D.	Mean %	S.D.	Mean %	S.D.
61	23.1	203	76.9	0	0.0	3	18.2	27.1	78.9	30.7	0	0

Table 5. Trainee Characteristics

7. How long have you been involved with the Center?

Individual Frequencies														Center Level	
Less than 6 months (0.5)		1 Year (1)		2 Years (2)		3 Years (3)		4 Years (4)		5 or More Years (5)		Missing Data		Mean	S.D.
N	%	N	%	N	%	N	%	N	%	N	%	N		N	%
37	14.3	62	23.9	72	27.8	40	15.4	20	7.7	28	10.8	8		2.09	0.79

8. Have you been funded by the Center with which you are affiliated?

	Individual Frequencies		Center Level	
	N	%	Mean %	S.D.
No, not funded (0)	6	2.3	3.0	10.5
No, funded by other sources (1)	17	6.5	5.9	10.0
Yes, partially funded (2)	82	31.5	31.1	27.3
Yes, fully funded (3)	146	56.2	46.3	29.5
Other (9)	9	3.5	3.0	6.3
Missing Data	7			

9. Will your thesis, dissertation, or postdoc research be based on a Center project?

	Individual Frequencies		Center Level	
	N	%	Mean %	S.D.
No (0)	21	8.1	7.8	11.6
Yes (1)	179	69.7	57.2	35.7
Don't know yet / Not approved yet (2)	45	17.5	21.0	28.7
Not applicable to my degree/training (9)	12	4.7	2.1	6.6
Missing Data	8			

10. What degree/training are you currently pursuing?

	Individual Frequencies		Center Level	
	N	%	Mean %	S.D.
Bachelor's degree (1)	6	2.3	2.2	6.4
Master's degree (2)	45	16.9	13.1	22.7
Doctoral degree (3)	177	66.3	64.6	32.8
Postdoc (4)	26	9.7	9.6	20.2
Other (9)	5	1.9	1.5	4.3
Missing Data	8			

12. What is your gender?

	Individual Frequencies		Center Level	
	N	%	Mean %	S.D.
Male (0)	190	74.5	64.6	35.7
Female (1)	58	22.8	22.6	28.7
Another gender identity (2)	1	0.4	0.4	2.1
Prefer not to say (9)	6	2.4	0.9	3.2
Missing Data	12			

13. What is your citizenship status?

	Individual Frequencies		Center Level	
	N	%	Mean %	S.D.
US citizen/permanent resident (1)	108	41.7	34.9	34.6
International student/postdoc (2)	142	54.8	55.4	36.9
Other (3)	5	1.9	0.9	3.8
Prefer not to say (9)	4	1.5	0.4	1.7
Missing Data	8			